came to the conclusion that the suspected flint *hâches* are modern fabrications, and that an ingenious and successful fraud had been practised by the workmen. The editor, however, allows M. Figuier's version to stand, feebly qualified by a note in small print, that "it should rather have been said that the ultimate and well-considered judgment of the English geologists was against the authenticity of the Moulin-Quignon jaw." Why, then, let M. Figuier's error be allowed to mislead the English public? The high antiquity of man is amply proved by the genuine flint *hâches*, without involving the apocryphal Moulin-Quignon jaw, which throws a certain degree of doubt on the whole question.

In 1823 Dr. Buckland advocated the theory of a great diluvial flood which swept over the earth, destroyed the extinct mammalia, and conveyed large blocks of stone far from their parent rock. This he shortly after withdrew. From that time down to the present no attempt has been made in England in any scientific work to account for facts which the author could not understand, by the hypothesis of a deluge. The glaciers and ice-bergs are supposed to have transported the blocks of stone, and the presence of the remains of men and animals in caves is accounted for either by the fact of their having lived and died in them, or by their having been swept in by the action of water. Now, however, M. Figuier brings again the old exploded theory to the front. He speaks of the "cataclysm of the European deluge of the quaternary epoch," as if it were an article of geological faith; "the European diluvial inundation was, as we know, posterior to the glacial epoch, a great catastrophe, the tradition of which is preserved in the memory of all nations, marked in Europe the end of the quaternary epoch." In the first place there is not the slightest proof to be adduced of anything of the kind having ever happened in Europe, and in the second there is proof direct that it did not happen at the end of the so-called quaternary epoch. And the proof direct is furnished by the fact that the quaternary mammalia die out one by one, gradually and not all at once. There is an unbroken sequence of animal life in Europe from the Pliocene to the present day. This old diluvial theory runs more or less throughout the first part of the book, and leads the author very frequently astray. There are also minor points which require correction. The little globular sponges, with a hole in the middle, washed out of the chalk, and found in the gravel at Amiens, which are supposed by Dr. Rigollot to have formed necklaces, are figured as "fossil shells." If the author will refer to D'Orbigny he will find that it is figured as *Coscinopora globularis*. That it is a protozoon and not a shell there can be no doubt. It is indeed hard to understand how the mistake could have occurred, for the arrangement of M. Figuier's woodcuts is the same as that given by Sir Charles Lyell ("Antiquity of Man," p. 119) by whom it is rightly described. Again, why does the editor allow M. Figuier to call Professor Huxley "Hippocrates Huxley," Professor Vogt, "Galen Vogt," and Sir Charles Lyell "Celsus Lyell," because the first says that the Engis skull might have belonged to a philosopher, the second, that it belonged to a degraded savage, and the third offers no opinion whatever? It is a piece of wit too subtle for ordinary minds. The latter is certainly not a Doctor, nor has he written, like Celsus, on agriculture, rhetoric, or military affairs. The only possible point of resemblance between the three couples is that each was at the head of his own particular profession in his own time.

The portion of the book relating to the Neolithic Bronze and Iron ages is much better than the earlier part, but it contains little or nothing of importance that has not been published by Sir John Lubbock. We have done our duty by calling attention to the leading blunders. The book is the work of a remarkably skilful compiler, and is written altogether for effect. W. B. D.

OUR BOOK SHELF

An Elementary Course of Plane Geometry and Mensuration. By Richard Wormell, M.A., B.Sc. Second Edition, revised and enlarged. Fcap. 8vo., pp. 276. (London: T. Murby.)

THIS book is the work of a reformer, not so much of geometry, as of the mode of presenting it to the young. Sciences begin in practical applications, and tend by a universal law to become more and more abstract; and the doctrine of the reforming school is that whatever the science may have developed into, it is necessary in teaching it to go back to practical applications, and to seek for a sure foundation for abstract notions in the familiar experience of common objects. Teachers need to be incessantly reminded of this necessity. In teaching physics or chemistry or botany it is perhaps admitted, though not always obeyed; but in mathematics it is generally not admitted; and when admitted, it is rarely followed out to its logical consequences. Geometry, arithmetic, algebra, must alike be presented first in their applications; and then alone, in most cases, can definition and soundness be given. In most cases, we say, because where mathematical talents of a moderately high order exist, as in the generality of mathematical teachers, this necessity is not felt. And for this reason mathematical teachers who are not also observant of mental phrases, may be slow to believe what has just been pointed out as a necessity in their art. Many of them, we suspect, have a secret sympathy with the mathematician who proposed the health of "The prime numbers, the only branch of mathematics that has not been defiled by contact with the concrete."

The aim of Mr. Wormell's book is to teach scientific geometry, the logical dependence of truths on one another being shown, and to make the teaching sound by giving familiar illustrations of all the conceptions involved, and applications of the result attained. The book is interspersed with examples, geometrical and arithmetical. Among the subjects mentioned—we turn to the index, as giving a good idea of the book—are star polygons, axis of symmetry, graduation, land-surveying, spirals and volutes, transmission of motion by cogs, &c. Considering what the aim of the writer seems to have been, the illustrations and applied part of the book have been well done. It is generally clear, moreover, and accurate in style, and is interesting. In form it is adapted for a school book; and for certain schools it may be a success. But it fails as a scientific geometry intended to replace Euclid, in three respects; want of clear statement of axioms and exhibition of the science as rigidly deductive; the avoidance of the difficulty of incommensurables; and a degree of undefinable inelegance of treatment throughout. The book is too long, and is too nearly scientific, to use as an introduction to Euclid or to any of its modern substitutes; and, though it would replace them with advantage if the mathematical education of the student were to end with the reading of this book, it is not easy to see how the student proceeding to higher mathematics could do so without previously mastering another more complete

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geometry. It seems to me, therefore, a successful contribution to "technical education," and a valuable and suggestive attempt, but not altogether a successful one, to teach scientific geometry on true principles. The book is well adapted for middle-class schools. It is scarcely worth while to notice minor faults, either of the printer, which are very few, or of style. But it is really to be regretted that a degree should have been defined thus:—"Suppose we have a circumference sufficiently large to be divided easily into 360 equal parts, each part is called a degree." A degree is an angle, and this conception ought to be prominently brought forward.

J. M. WILSON

THE *Sitzungs-Berichte* of the Isis Natural History Society of Dresden for the first three months of the present year contains, as usual, a great number of short communications of more or less interest, and among them a few longer notices. Of the latter we may mention a note on the "Occurrence of Precious Stones in Saxon Switzerland," by M. A. Stelzner; a paper on "Diatomaceæ," by Dr. Eulenstein; a notice by Count Pourtalès on the "American Deep Sea Explorations;" a paper on the "Course of the Boomerang," by Professor Schneider; and, especially, a paper (illustrated) by Dr. Geinitz, on some "Fossil Fruits from the Zechstein and Coal Measures." The society has established a section for prehistoric archæology, the first meeting of which is here recorded; its proceedings consisted chiefly in the delivery of a long opening address by the President, Captain Oscar Schuster.

WHETHER the inhabitants of Rhenish Prussia and Westphalia are at the present moment devoting much of their attention to Natural History may fairly be doubted, but hitherto they have shown great activity in this department, and the publications of their Natural History Society generally contain much valuable matter. We have lately received the volume of their transactions for 1869 (*Verhandlungen des Naturhistorischen Vereins*, vol. xxvi.), in which we find several important papers. Kaltenbach contributes the continuation of his valuable "Natural History of the German Phytophagous Insects," consisting of an alphabetical list of the principal plants growing in Germany, either in a wild or cultivated state, with an account of the insects feeding upon each of them. Dr. C. Schlüter gives descriptions of numerous fossil Echinodermata from North Germany, with good illustrations on three large plates; whilst from Mr. F. Winter we have a contribution to the knowledge of the cryptogamic flora of the Saar district, now the scene of military operations. Another important botanical paper is a contribution to the flora of the Rhine by Dr. P. Wirtgen. In the section of the work denominated the "Correspondenzblatt" we find a note by Dr. Mohr on the "Theory of Coal," and in the "Proceedings of the Natural History and Medical Society of the Lower Rhine," a great number of notices upon scientific subjects of all sorts. This latter part is published separately for the present year. We have received the first number for 1870, including the proceedings during January and February.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his Correspondents. No notice is taken of anonymous communications.*]

School Natural History Societies

IN your notice of the various School Natural History Societies, you have omitted one, which has been established for more than a year, and is now in a very flourishing state. I allude to the Clifton College Scientific Society. Unfortunately, no one is here to give me any statistics, but I understand that it has seventy members, with about twenty more waiting for admission. Mr. Percival has built a museum at a cost of 1,500*l*., which will, I believe, be opened next September.

T. B. PRESTON

4, Lanesfield Villas, Durdham Down, Bristol
August 1

IN the leading article of NATURE for July 28 (which I have just received), you name some of the chief public schools in which Natural History Societies exist. I am sorry you have omitted to mention Cheltenham College as among that number, and conclude the omission arose from ignorance of the fact. Perhaps it may be interesting to some readers of NATURE to hear that last March, a society consisting of members of that College, was founded under the presidency of the principal (Mr. Jex-Blake) to whom the college is much indebted for the encouragement of Natural Science as a part of the general education of the place.

The Society numbers about fifty members, the department chiefly worked at present being botany, at which several of the boys are becoming tolerably proficient, with a small sprinkling of devotees to geology and zoology.

Our difficulty lies in making meetings sufficiently attractive. Original papers, containing original observations, are scarcely to be expected from the boys themselves till they have been educated to observe; and in our case the number of masters who take an active part in the society is too few to keep interest alive. I cannot, however, doubt, in spite of such difficulties, which have been felt (and in some instances overcome) by others as well as ourselves, that these societies are sowing good seed of which it is not too much to hope the world and science will reap the fruit by-and-by.

L. C.

Boscastle, Cornwall, Aug. 10

Our Dublin Correspondent and the Parturition of the Kangaroo

ON my safe delivery, after a good deal of labour, from the perils of war, and on my arrival in London from Germany, I found your letter, enclosing a copy of Dr. J. Barker's communication as printed in your issue of the 14th ult. Dr. Barker has, apparently, no fault to find with my report, which, as a matter of necessity, could not be otherwise than imperfect. But he somewhat loftily criticises the writer of the comments on my report, who, in spite of the facetious title given to him by Dr. Barker, I believe to be a gentleman of considerable merit, and one whose comments on my correspondence appear to be always most just. Dr. Barker is right when he states that the late Earl of Derby's father did not observe the facts about the Kangaroo which he records; these were observed by the keeper of his collection, but they were placed on record by the Earl and hence the mistake. Dr. Barker seems annoyed that he should be made to appear as if he adopted the views, the absolute nonsense, of the writer whose paper he permitted to be read. Those who know Dr. Barker know what absolute nonsense it would be to believe him capable of adopting them. Yet, ought he not, as chairman, to have repudiated and refuted them? Would it not have been well if he had given the members of the learned societies, on the occasion in question, the information which he now offers to the readers of NATURE, and instead of telling them "that the actual passage of the fœtal kangaroo from the uterus to the pouch was not yet proved," he had told them that the fact of there being such an actual passage had long since been proved; though how the actual transit, whether with the help of the mother's paws or lips, takes place, is still regarded as a matter for further observation; and so, instead of appearing to justify the reading of such a paper as the one referred to, he would from the extent of his knowledge on the subject, have reflected credit on his position, and on the societies to which he belongs, and have made, at least, an effort to advance the science he is so zealous for.

August 13 YOUR DUBLIN CORRESPONDENT

The Horse-Chestnut

I SAW to-day in the last number of NATURE, a letter on the meaning of the word horse-chestnut. As I do not see NATURE regularly, I do not know whether any of your correspondents have called your attention to the similar use of *ἵππος* in composition. In case this should have escaped them, I send the following extract from Liddell and Scott:—

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